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RECEIVER FOR DISCRETE MULTITONE  
MODULATED SIGNALS HAVING WINDOW FUNCTION

ABSTRACT OF THE DISCLOSURE

A receiver structure for improving the performance of conventional Discrete Multitone Modulation (DMT) based Asymmetric Digital Subscriber Line (ADSL) modems, particularly in the presence of noise and/or interference. A conventional demodulator having an FFT followed by a single-tap-per-bin frequency-domain equalizer is augmented by an additional data-path utilizing windowing or pulse shaping. Windowing is done independently for each symbol over the orthogonality interval and can be carried out efficiently in the time domain or frequency domain. A decision feedback equalizer is used at the output of the windowed data-path to cancel inter-bin-interference created by windowing. Windowing is most effective against narrowband interference (NBI) and other conditions which lead to diminished orthogonality between bins such as inadequate channel shortening in ADSL, symbol timing offset and jitter. Limited performance gains may also be achieved in the presence of crosstalk with strong spectral coloration. The overall technique is potentially also applicable to other DMT based modems such as VDSL and wireless OFDM. The receiver does not require changes to be made to the transmitter.

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